BOLIVAR DAM
TUSCARAWAS RIVER, OHIO
DRAFT
INTERIM RISK REDUCTION MEASURES
ENVIRONMENTAL ASSESSMENT

June 2008

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA

DRAFT

FINDING OF NO SIGNIFICANT IMPACT
Interim Risk reduction Measures
Bolivar Dam, Muskingum River Basin, Ohio

I have conducted an environmental assessment in the overall public interest concerning implementation of the certain interim risk reduction measures for the Bolivar Dam. This purpose of this project is to address problematic seepage at Bolivar Dam. Action is needed because the excessive uncontrolled seepage is negatively affecting the structural stability of the dam resulting in increased risks to the downstream public. Due to the history of excessive seepage through and under the dam and through the left abutment during events with frequent return periods, it was ranked by the U.S. Army Corps of Engineers Screening for Portfolio Risk Assessment (SPRA) process as a Dam Safety Action Class II – Urgent (unsafe or potentially unsafe) project.

1. The proposed action is needed to address seepage problems and thus minimize the potential for catastrophic failure of the dam during major flood events.

2. The major features of the selected plan include tree removal, downstream access improvement, terrace seepage blanket augmentation, and construction of an area for stockpile of granular material.

3. The possible consequences of the project have been studied for biological, cultural and social effects. Another factor bearing on my assessment was the capability of the project to meet the public needs for which it was proposed. The following references that assessment:

a. Biological Considerations. The Huntington District has taken reasonable measures to assemble and present the known or foreseeable environmental impacts of the project in the environmental assessment. These impacts involve biological and human resources. Wetland impacts as a direct result of the proposed action will affect 1.92 acres of Class 1 and Class 2 wetlands. Mitigation for wetland impacts will be through an approved wetland mitigation bank. All adverse effects of project implementation are insignificant or may be avoided through management techniques, or mitigated in the case of wetland impacts. Therefore, no significant impacts to biological resources would occur as a result of the proposed action.

b. Social Well-Being Considerations. The proposed project will provide benefits to the downstream areas regardless of ethnic or socioeconomic status, and the project would not disproportionately affect low-incomes or minority populations. Moreover, the project would not create adverse human health or environmental effects. No significant economic or social well-being impacts are foreseen as a result of the proposed action.

c. Cultural Resource Considerations. There is a probability that archaeological sites will be impacted by the proposed actions. The Corps has engaged in consultation with the State Historic Preservation Office (SHPO), pursuant to the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA). Detailed surveys, testing, evaluation, effect determination and mitigation planning will be performed prior to implementation of the proposed action as necessary. Coordination with the State Historic Preservation Office will be maintained throughout this process to ensure full compliance with Section 106 of the NHPA.

d. Coordination with Resources Agencies. Pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1958, coordination with the U.S. Fish and Wildlife Service (USFWS) has been

made. No significant effects on fish and wildlife would occur as a result of the proposed action. To avoid impact to Federally Listed Indiana Bat, clearing activities would be conducted per recommendations of the USFWS. In accordance with the Endangered Species Act, as amended, the selected plan would not impact listed species.

e. Other Pertinent Compliance. The proposed action is also in compliance with the National Historic Preservation Act, (Section 10632 CFR 300), Executive Order (EO) 11988 (Floodplain Management) and EO 11990 (Protection of Wetlands).

f. Other Public Interest Considerations. There has been no significant opposition to the proposed action by State or local Governments, or organized environmental groups. Comments received during the public review period have been included in the Final Environmental Assessment. There are no unresolved issues regarding the implementation of the project.

g. Section 176(c) Clean Air Act. The proposed action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. The proposed action is exempted by 40 CFR Part 93.153 from making a conformity determination, since estimated emissions from construction equipment will not exceed *deminimis* levels or direct emissions of a criteria pollutant or its precursors. Therefore, no significant impacts to air quality would be expected from the proposed action. Any later indirect emissions are generally not within the Districts' continuing program responsibility and generally cannot be practicably controlled by the District.

4. I find the Interim Risk Reduction Measures, Bolivar Dam, has been planned in accordance with current authorization as described in the Environmental Assessment. The project is consistent with National policy, statutes, and administrative directives. This determination is based on thorough analysis and evaluation of the project and alternative courses of action. In conclusion, I find the proposed Project will have no significant adverse effect on the quality of the human and/or natural environment.

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DATE

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DANA HURST
Colonel, Corps of Engineers
Commanding

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1.0. BACKGROUND

Bolivar dam is located on Sandy Creek of the Tuscarawas River, a tributary of the Muskingum River, 183.4 miles upstream of the confluence of the Muskingum with the Ohio River. Bolivar Dam is located near the town of Bolivar Village, Ohio, in Stark and Tuscarawas Counties. Bolivar Dam is a Dry Dam which by definition does not have a permanent pool or lake behind the dam. Only during times of excessive rain and prevention of downstream flooding does the dam retain water creating a temporary pool.

Figure 1. Bolivar Dam, aerial view.

The population of Bolivar Village is 894. More sizable population centers in the inundation area of the dam are Dover City (located 12 miles to the south) and New Philadelphia City, Ohio (located 16 miles to the south) with populations of 12,210 and 17,056 respectively. The floodplain between Bolivar Dam and the larger downstream population centers can generally be described as broad, rolling hills. Development downstream of the dam is fairly light, consisting of several small towns, small farming communities, with some light industrial and light commercial development. Also in the inundation area is Zoar Village, Ohio which is three miles to the west of Bolivar Village. The Village of Zoar was founded by the German religious dissenters in 1817 as a communal society. Many of the original structures remain and are subject to the requirements of the National Historic Preservation Act. The population of Zoar Village is 193.

Bolivar Dam is one of a system of dams designed to provide flood control and water conservation in the Muskingum Watershed in Southeastern Ohio. It is a "dry dam" and does not retain a permanent pool during any season of the year. The outlet works

normally pass the entire flow of Sandy Creek, except during periods of flood retention. The amount of time required for flood retention varies from year to year. However, based on historical records, water is usually impounded for about 10% of a typical year. The drainage area upstream of the dam is approximately 500 square miles and the storage capacity is 150,000 acre-feet.

Bolivar Dam was completed in September 1938, and is a two-zoned, rolled earthfill embankment with an impervious core and pervious upstream and downstream shells. The total crest length is 6,300 feet with approximately 1,300 feet at a height of 87 feet and 5,000 feet of a lower level dike from 20 feet to 50 feet high. The foundation of the dam is glacial outwash material and the depth to bedrock is up to 230 feet below the crest of the dam. The top of dam elevation has been raised from elevation 982 feet to elevation 985.5 feet by construction of a 3.5-foot high parapet wall along the upstream face of the dam. The dam was raised to correct a spillway deficiency created by up-to-date design criteria.

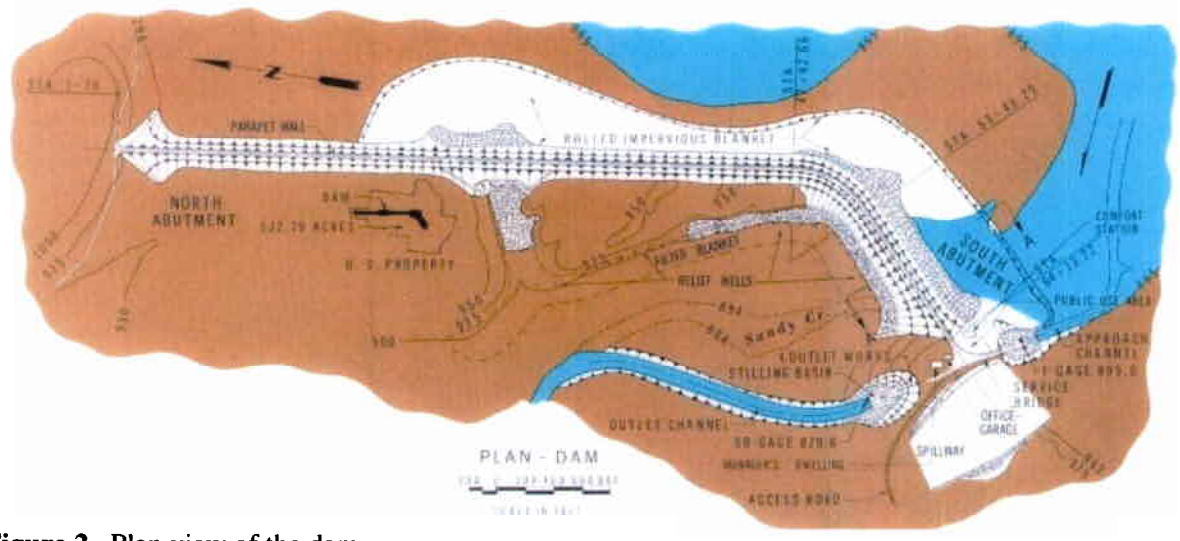

Figure 2. Plan view of the dam.

The outlet works at the left abutment of the main embankment consists of twin concrete lined tunnels, an intake tower, walls, and stilling basin founded on rock. The intake structure consists of a reinforced concrete substructure and a brick superstructure. Six caterpillar gates, each 7.0 feet wide by 15.0 feet tall are contained in the intake structure. The invert of each gate opening is at elevation 895.0 feet. The outlet conduits consist of twin, 16-foot-diameter horseshoe-shaped, concrete-lined tunnels. The tunnels are connected to the intake structure through transition sections and extend 814 feet through the south abutment to the stilling basin. The stilling basin is a reinforced concrete structure of conventional hydraulic jump design with baffle blocks and an end sill for energy dissipation. The floor slab is anchored to rock and drain holes four feet into rock are provided to relieve uplift pressure.

The emergency spillway is a trapezoidal cut through the left abutment approximately 300 feet west of the outlet works. The spillway base width varies from 540 feet at the crest at

elevation 962.0 feet to 140 feet at the downstream end. The spillway crest is founded on rock but the downstream channel is concrete lined for 220 feet below the crest. The overall length of the spillway is approximately 1200 feet. The design discharge is 61,700 cfs with a surcharge of 18 feet and a freeboard of 2 feet.

2.0 AUTHORITY

Investigations for dam safety at completed USACE's projects are authorized under Presidential Memoranda of April 23, 1977 and October 4, 1979. The modification of existing structures is authorized under the Flood Control Act of 1938 (Pub. L. 75-761).

3.0 PURPOSE AND NEED

The purpose of the proposed action described herein is to reduce risk of dam failure associated with Bolivar Dam's underseepage issues until major rehabilitation of the dam can be completed.

Bolivar Dam has a history of excessive downstream seepage and the potential of through-seepage, underseepage, and slope instability at design pools. The Sandy Creek valley is a broad, deeply filled pre-glacial valley consisting of sorted glacial outwash materials with possible lenses of open work gravels. The glacial deposits, upon which the dam is founded are composed of pervious, fine to coarse gravelly sands, generally about 150 feet thick. Based on a review of the subsurface and instrumentation data, unsatisfactory performance of similar projects across the USACE inventory, and based on observed performance during the pool of record in 2005, it is believed that several areas of the embankment and/or foundation would become unstable due to piping at some pool less than the spillway crest level. This instability would threaten the integrity of the dam and could lead to a complete dam failure.

Significant seepage was first noticed during the relative minor rise associated with the July 1969 Muskingum Flood. Observers in the field reported that numerous concentrated seeps and boils were observed downstream during this event. This inadequate performance prompted the construction of an upstream stability berm for the main embankment to protect against rapid drawdown slope stability failure and the installation of downstream relief wells and filter blanket to protect against underseepage instability.

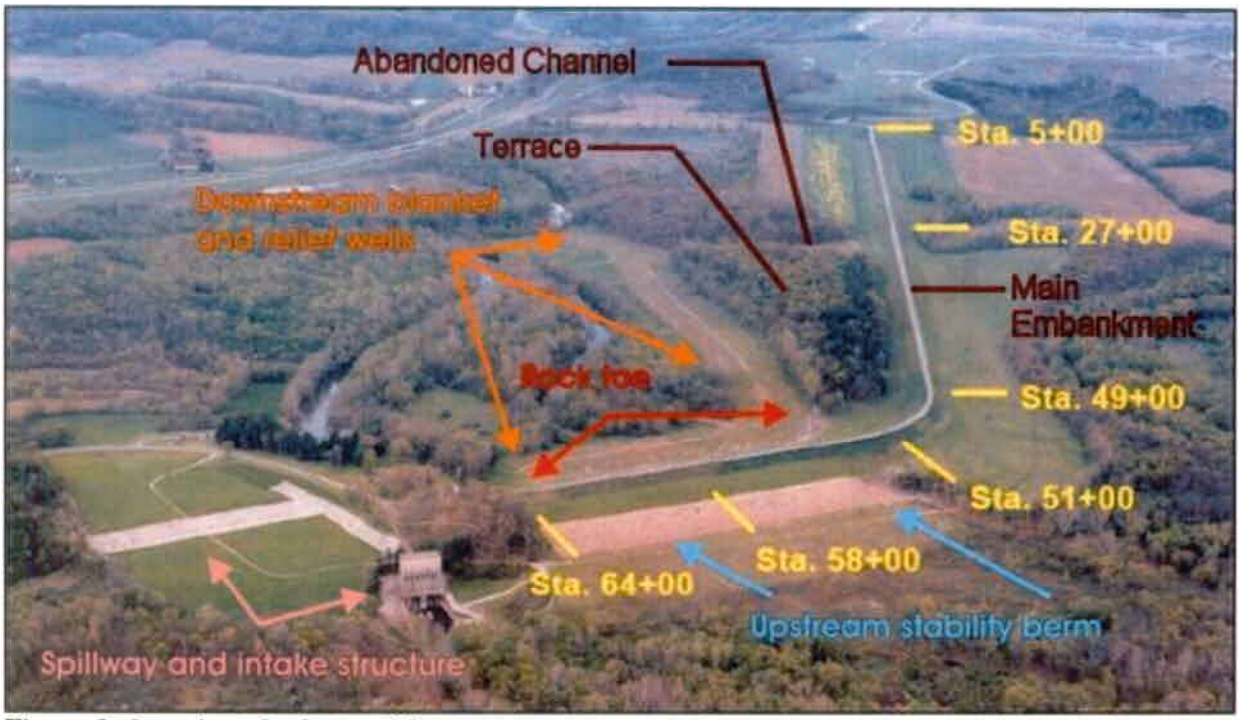

Figure 3. Location of referenced features.

Bolivar Dam is rated as a US Army Corps of Engineer Dam Safety Action Classification-II Dam (DSAC-II). The USACE DSAC Table defines a DSAC-II dam as a dam where:

> "***Failure initiation foreseen*** - For confirmed and unconfirmed dam safety issues, failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety"; or, "***Very high risk*** – the combination of life or economic consequences with probability of failure is very high."

Concerns are discussed as follows:

Main Embankment. The concentrated seeps downstream of the filter blanket were producing significant amounts of water. Fine sand and silt size material was observed moving out of the ground at these locations. The tailwater obscured observation during the higher elevations of the pool (pool elevations above approx. elevation 940 feet). The concentrated seeps are typically observed in this area when the pool elevation reaches approximate elevation 920 feet (1-year return period).

Terrace Area. The terrace area was observed to produce significant amounts of seepage exiting the ground surface above the rock toe. This seepage was first noted at pool elevations of approximately 930 feet (3-year return period). The seepage increased in quantity and the exit point continued to rise in elevation as the pool elevation increased. During the pool of record, it was decided that this area may become unstable with higher pool elevations; therefore, a filter blanket was placed comprised of one foot of #57 river gravel (range in size from 0.25 to 1.5 inches) overlain by one foot of No. 2 river gravel

(1.5 to 3 inches). Piping of material in the terrace area has occurred at pool elevations of 949 to 952 feet (75- and 100- year return period).

In the vicinity where the Sandy Creek channel meanders close to the upstream toe of the dam, seepage was observed at the toe of the natural terrace deposits just upstream of the filter blanket. The seepage exiting the slope carried fine to medium grained sand out of the in situ soil deposit. This condition was observed to be pervasive over approximately 700 feet along the axis of the dam and continued to increase as the pool elevation increased.

Abandoned Natural Stream Channel. Another possible area of concern is the abandoned stream channel in the vicinity of Sta. 27+00. This area has been treated with filter blanket and relief wells for underseepage, however conditions exist where the seepage could exit the natural terrace on either side of the filter blanket at higher elevations. Problematic conditions were not observed during past significant pools.

Figure 4 below shows an aerial view highlighting the areas of concentrated seeps below the dam embankment as observed during past significant pools.

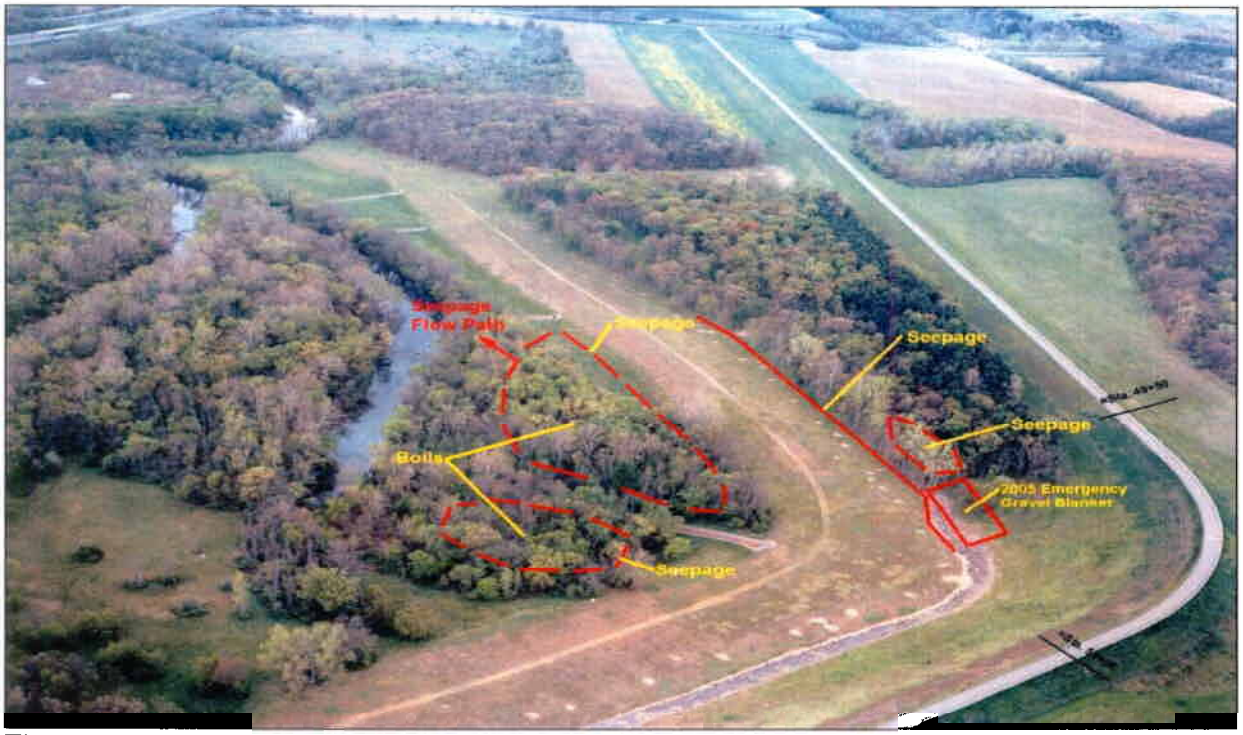

Figure 4. Downstream Seepage areas.

Right Abutment. In the vicinity of the right abutment, around Sta. 5+00 the foundation material consists primarily of poorly graded sands and gravels. The ground elevation at this location is generally above Elevation 950 upstream and approximately Elevation 955 downstream; therefore, this portion of the embankment has never had water on it. It has been noted in several past studies as an area of concern. This region of the project is currently being evaluated for slope and stability as part of the Major Rehabilitation study.

Left Abutment. Based on observations during past significant pools, it appears that water is entering a coal/underclay/limestone unit at approximate el. 935 on the upstream face of the abutment. The water travels through the bedrock at the left abutment and exits from the cut slope just above the outlet tunnel/stilling basin. This uncontrolled seepage has been observed at pools greater than approximately el. 943 (50-year return interval). The extent of the seepage path through the abutment bedrock cannot be verified; therefore, the future integrity of the abutment/embankment contact is in question. At this point, seepage has not been observed at the abutment/embankment contact during significant pools; however, this uncontrolled seepage is perceived as a deficiency. Two new piezometers were also recently installed to attempt to determine the existing seepage path with colored dye during high pool events. The potential for unsatisfactory performance versus pool elevation for this region of the project is being evaluated through an expert elicitation approach as part of the Major Rehabilitation study.

4.0 PROPOSED ACTION AND ALTERNATIVES

Interim Risk Reduction Measures (IRRMs) are actions intended to minimize risks to the human environment that may result from failure of a dam. The IRRMs are intended to be actions that can be implemented in a timely manner prior to the proposed major rehabilitation of Bolivar Dam[1]. The IRRMs for Bolivar Dam were developed in accordance with Corps Policy as prescribed in USACE regulation (EC 1110-2-6064 Interim Risk Reduction Measures for Dam Safety, 2007).

Descriptions of the proposed IRRMs for Bolivar Dam are as follows:

IRRM 1. Tree Removal. Removal of trees would occur in areas where boils have been observed, including areas on the downstream terrace and within selected areas downstream of the existing sand and gravel seepage blanket. Tree clearing would also be required for an area along the old stream channel that is within 250 ft. of the toe of the dam. Trees would be removed along with the root system and disposed of according to USACE regulations (ER 405-1-12). Following tree removal, the area would be graded smooth in order to backfill voids left after removal of the root ball with on-site material. Cleared areas would be seeded and mulched. The area would be kept mowed sufficient to allow for monitoring and surveillance during future high pools.

IRRM 2. Downstream Access Improvement. Vehicle access along the downstream terrace and dam is proposed to be improved so that access can be maintained as the Dover Pool backs up during flood events along the downstream

[1] The USACE is preparing the *Bolivar Dam: Major Rehabilitation Evaluation Report and Environmental Assessment* which documents the evaluation of proposed major rehabilitation efforts planned for the Bolivar Dam. That document will be made available for public comment pursuant to NEPA, Summer 2008.

toe of Bolivar Dam. Proposed vehicular access road would provide necessary access for the emergency placement of granular material. The purpose of placing granular fill is to allow seepage to freely exit while retaining the foundation soils.

IRRM 3. Terrace Seepage Blanket Augmentation. The existing granular seepage blanket would be augmented on areas of the downstream terrace and along the downstream slope of the terrace for a distance of about 1800 feet (Stations 31+00 to 49+00). Augmentation would consist of clearing and grubbing of vegetation and placement of about 3,260 cubic yards of bank run sand on the terrace and 26,000 tons of crushed rock on the slope.

IRRM 4. Stockpile Granular Material. Suitable granular material to be used for emergency measures during high water events would be stockpiled on site in a specifically prepared area on the terrace. Approximately 2,000 tons of granular material (bank run sand and stone aggregate is anticipated to be stockpiled. This quantity was estimated based on both past emergency work and potential failure mode scenarios with estimated remedial action efforts.

IRRM 5. Instrumentation Reliability and Redundancy. Shortcomings in the existing instrumentation for monitoring Bolivar Dam resulting from the downstream area being submerged beneath tail water during low-frequency events would be addressed An automatic data acquisition system (ADAS) to measure piezometric pressures and relief well flows in critical sections would be considered to address shortcomings.

IRRM 6. Modify Interim Operating Pool. The project operating pool is a pool elevation at which the project would be managed whenever possible to provide the greatest acceptable level of safety to the dam. Until all required repairs are sufficiently completed to return the dam to its designed capability, the Corps has determined that it is in the public's interest to release waters earlier during a storm event to prevent pool levels from exceeding unsafe elevations. This will result in less flood waters being retained during larger rain events. As IRRMs are employed, this pool management elevation is subject to change.

IRRM 7. Labor Resource Plan. The Corps intends to develop a plan to maximize performance of personnel and equipment for all projects throughout the Muskingum district in order to be more prepared in the case of an event.

IRRM 8. Potential Failure Modes Analysis. An informal Potential Failure Mode Analysis (PFMA) has already been conducted for this project. Upon standardization and publication of a Corps of Engineer Potential Failure Modes Analysis (PFMA), a formal PFMA will be prepared. A PFMA involves a thorough review of all available design, construction, and operation records by a cross-functional team of engineering and operations personnel and will help to ensure that all likely failure modes have been identified. If any new failure modes are identified by the formal PFMA, they will be rank ordered based on risk and

appropriate counter-measures developed. The results of the formal PFMA may require either adding new measures, reprioritizing existing Interim Risk Reduction Measures, or may even change or add measures to the long term fix.

IRRM's requiring consideration under National Environmental Policy Act (NEPA)

IRRM 5 "Instrumentation Reliability and Redundancy", IRRM 7 "Labor Resource Plan", and IRRM 8 "Potential Failure Modes Analysis" are categorically excluded from documentation under NEPA as an "Activity at completed Corps project which carry out authorized project purposes" (USACE ER 200-2-2). Therefore, no documentation pursuant to NEPA is required.

The Modify Interim Operating Pool (IRRM 6) is a recognized target maximum pool elevation for operation of the Bolivar Dam. This elevation was calculated based on engineering criteria and data. This maximum target pool elevation would provide a reasonable margin of safety against dam failure. Typically, Corps dams are operating during major storm events to attempt to not exceed spillway crest elevation. With this new engineering information, the Corps would similarly try to not exceed this interim operating elevation; however, as with operation of any dam, hydrologic circumstances may preclude such action. The interim operating elevation is purely a technical consideration – there is no alternative available. This IRRM is not considered a "federal action" in that it is not an adoption of federal policy, formal plans, program, or specific project (43 FR 55990, Nov. 28, 1978, Part 1508.18) and is not considered in this document.

Proposed Action and the No Action Alternative

The *proposed action* in this Environmental Assessment is defined as those actions described as IRRM's 1, 2, 3 and 4 (Tree Removal, Downstream Access Improvement, Terrace Seepage Blanket Augmentation, and Stockpile Granular Material). In addition to the proposed action, the No Action alternative is also evaluated herein as required by NEPA. The "No action" alternative would involve no implementation of the measures described as IRRM's 1, 2, 3, and 4. Although each IRRM has independent utility, the measures were formulated as a whole to provide an essential reduction in risk of dam failure until major rehabilitation of the dam can be performed.

In formulation of the proposed action, environmental consequences have been considered throughout the planning process. For example, the aerial extent where tree removal and clearing are proposed has been minimized to only that area deemed essential for emergency operations and observations, as the case may be. Considerations to avoiding, minimizing, and mitigating effects of the proposed action are described in the following section for each resource considered as appropriate.

5.0 ENVIRONMENTAL CONSIDERATIONS

5.1 Land Use

With the exceptions of the existing dam and associated facilities, most land at the site is not developed and includes forest, shrub, and wetland habitats. Recreational hunting is allowed in the project area, except within 200 yards of a structure (the earthen dam excluded). A total of 28 acres of forested area downstream of the dam would be cleared with the proposed action. Within this area are three wetlands that total 1.92 acres. The proposed clearing would change some habitat types and therefore the type of hunting would correspondingly change, but the area available for hunting would remain unchanged. Therefore, changes in land use under the proposed action would be minor.

Under the No Action alternative the areas would remain in their current condition and the current land use would not change.

5.2 Physiography, Geology, Soils and Prime Farmland

The project area lies within the unglaciated region of Ohio. It is located within the Muskingum-Pittsburgh Plateau region of the Appalachian Plateaus physiographic province. Topography of the area can best be described as a moderately-high to high relief dissected plateau having broad major valleys that contain outwash terraces and tributaries with lacustrine terraces[2]. Underlying bedrock consist of Allegheny and Pottsville Groups, undivided of Pennsylvanian Age[3].

The *Soil Survey of Stark County, Ohio*[4] and the *Soil Survey of Tuscarawas County, Ohio*[5] depict six soil series within the study area. Relevant information for the mapped soil types is provided below.

- **Conotton** - This series consists of well-drained, level to steep soils that occur in outwash areas. These soils contain a large amount of gravel throughout.

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[2] Brockman, C. Scott. 1998. *Physiographic Regions of Ohio.* State of Ohio, Department of Natural Resources, Division of Geological Survey.

[3] Slucher, Ernie R. 2002. *Bedrock Geologic Map of Ohio.* State of Ohio, Department of Natural Resources, Division of Geological Survey.

[4] Christman, Richard L., Dwain D. Waters, and James R. Bauder. 1971. *Soil Survey of Stark County, Ohio.* U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center.

[5] Waters, D. D. and L. E. Roth. 1986. *Soil Survey of Tuscarawas County, Ohio.* U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center.

Conotton is not a hydric soil, but is an indicator of prime farmland of local importance.

- **Chili -** The Chili series consists of well-drained, level to steep soils that occur on broad stream terraces, outwash plains, and kames. These soils formed in glacial outwash of Wisconsin Age. Chili is not a hydric soil, but is considered an indicator of prime farmland.
- **Melvin** – The Melvin series consists of deep, poorly drained, moderately permeable soils that formed in silty alluvium on floodplains. Slopes range from 0 to 3 percent. This soil is hydric, and is an indicator of prime farmland if drained and protected from further flooding.
- **Pits, gravel** – This map unit consists of surface mined areas from which sand and gravel have been removed for use in construction. The pits are commonly on outwash terraces and in areas of the Chili, Conotton, and Wheeling soils, which are underlain by glacial outwash. This soil is not considered hydric nor an indicator of prime farmland.
- **Udorthents** – These soils are in areas of cut and fill, mainly in construction areas along highways, in urban areas, and near dams in the Muskingum Watershed Conservancy District. This soil is not considered hydric or prime farmland.
- **Wayland silt loam (Wd)** - A nearly level, very deep, poorly drained soil. Typically, the surface layer is silt loam about 2 inches thick. The surface layer has a high content of organic matter. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. The soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 3 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is hydric.
- **Wheeling** – The Wheeling series consists of well-drained, level to steep soils on stream terraces, outwash plains, and kames. These soils formed in silt loam glacial material of Wisconsin age that is underlain by gravelly and sandy outwash. This soil is not considered hydric. Wheeling soils are considered an indicator of prime farmland.

Specific soil types within the areas of impact of the proposed tree clearing, granular seepage blanket augmentation, and downstream access improvement include Melvin silt loam, Connotton gravelly loam and Chili gravelly loam. Only Melvin silt loam is considered prime if the area is drained or not frequently flooded. Currently the areas with this soil type is predominately wetland, therefore the area is not considered prime farmland. No impact to prime farmland is expected with implementation of the proposed action.

Under the No action alternative, current conditions would remain the same. Increased risks of dam failure during extreme flood events would remain. The effects of dam failure on these resources are largely unpredictable. It is likely that in a failure scenario, the Dover Dam would have a significant pool. In this case, the pool would greatly curtail any erosion and scouring from increased discharges, and thus reduce impacts on soils and prime farmland. However, some additional erosion and scouring would be anticipated relative to baseline conditions particularly in stream reaches immediate to the dam.

5.3 Wildlife Resources

Direct and indirect observations of wildlife resources in the area include the following: white-tailed deer (*Odocoileus virginianus*) tracks, beds, trails, and scat, squirrel nests, crayfish chimneys, woodpecker holes, moles, other small rodents, rabbit scat, water fowl, and frogs. A variety of birds were also observed, including cardinals (*Cardinalis cardinalis)* and blue jays (*Cyanocitta cristata).*

The wildlife resources present in the area are fairly common and generally tolerant of human disturbances such as those related to this project. Implementation of the proposed action would result in the conversion of 28 acres of forested habitat to grasses. However, much of the forest cover has little understory and is therefore low quality habitat for many wildlife species. Because the observed species are relatively mobile, direct mortality would be expected to be minimal from construction of the features or the proposed action. There are about 532 acres of federal property at the Bolivar project, the greater portion of which is forested. Tuscarawas County is approximately 56 percent forested, and based on the data available there has been little change in percent forest cover since 1982.[6] The loss of 28 acres of forest cover is therefore deemed minor with respect to impacts on wildlife.

Under the No action alternative, current conditions for wildlife would remain the same. No tree clearing, granular seepage blanket augmentation and downstream access improvement would occur. Increased risks of dam failure during extreme flood events would remain. Should dam failure occur, degradation of riparian and floodplain wildlife habitat impacts would be expected to occur in areas immediately downstream of the dam.

5.4 Endangered Species

The USFWS maintains a list of federally endangered, threatened, proposed, and candidate species in Ohio. This list, last updated in June 2007, lists Stark and Tuscarawas Counties as being in the range of four species. Information on these species is summarized below.

- **Indiana bat** (*Myotis sodalis)* **(endangered)** - Indiana bats hibernate during winter in caves or, occasionally, in abandoned mines. After hibernation, Indiana bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas and riparian areas along streams and rivers.

[6] Natural Resources Conservation Service, National Resource Inventory.

- **Clubshell** *(Pleurobema clava)* **(endangered)** - This mussel prefers clean, loose sand and gravel in medium to small rivers and streams. The clubshell mussel will bury itself in the bottom substrate to depths of up to 4 inches. Reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete the mussel's larval development. Extirpated from Alabama, Illinois, and Tennessee, it occurs today in portions of only 12 streams. Reasons for its decline in the upper Ohio watershed have been principally due to pollution from agricultural run-off and industrial wastes, and extensive impoundments for navigation.

- **Eastern Massasauga** *(Sistrurus catenatus catenatus)* **(candidate)** - Throughout much of its range in the eastern United States, massasauga rattlesnakes are found in wet prairies, sedge meadows, and early successional fields. Preferred wetland habitats are marshes and fens. They avoid open water and seem to prefer the cover of broad-leafed plants, emergents, and sedges. Natural succession of woody vegetation is a leading cause of recent habitat deterioration throughout its range. Intensive management to retard woody vegetation growth is necessary to maintain suitable habitat conditions.

The bald eagle is no longer a federally listed species. When the bald eagle was listed in 1967 as endangered under the forerunner of the Endangered Species Act, there were barely 400 nesting pairs in the entire lower 48 states. Now there are more than 9,700 nesting pairs in the United States. On July 6, 1999, the USFWS proposed de-listing the bald eagle (64 FR 36453), and on June 28, 2007, the USFWS de-listed the bald eagle from protections of the Endangered Species Act (72 FR 37346). The bald eagle remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Field observations and coordination with State and Federal natural resource agencies concluded Bald eagles and Eastern massasaugas are not in the project area therefore, no impacts to these species are anticipated. No small rivers or streams would be affected by the proposed action at Bolivar Dam; therefore, no impact to the clubshell mussel would occur.

Potential Indiana bat habitat was observed during field studies in areas of proposed tree clearing. Moreover, correspondence with the U.S. Fish and Wildlife Service (USFWS) suggested that the old Sandy Creek backchannel remnants and associated wooded buffer is of particularly high quality foraging habitat for the Indiana Bat. The USFWS suggested a buffer, 30 feet in width, should be maintained to help preserve the quality of the habitat. Consequently, the tree clearing limits were designated such that a 30 foot forested buffer would be preserved along the remnants of the Sandy Creek backchannel. To avoid potential effect to Indiana Bat, tree clearing would be conducted inasmuch as practicable between September 30 and April 1 when the Indiana Bat would not be roosting. Should clearing be required outside of the roosting period emergent and/or

mist-net surveys would be required prior to clearing, provided the results would indicate there would no affect to the Indiana bat.

Under the No action alternative, current conditions for wildlife would remain the same. No tree clearing, granular seepage blanket augmentation and downstream access improvement would occur. Increased risks of dam failure during extreme flood events would remain. Should dam failure occur, degradation of riparian and floodplain wildlife habitat impacts would be expected to occur in areas immediately downstream of the dam. However, as no endangered species have been identified in the vicinity of the dam, no impacts to such species would be expected under the No Action alternative.

5.5 Terrestrial resources

Vegetation in the area is associated with habitats that include mature coniferous and deciduous forest, shrubs, and wetlands. During the field investigations, 30 species of trees were identified within the project area with sizes ranging from saplings to mature trees 30+ inches diameter at breast height (dbh). Woody vines, ferns, grasses, sedges, and numerous species of herbaceous forbs were also identified during the field investigation. Herbaceous plant height ranged from basal leaves to over 7 feet tall.

All floral species present in the area are considered common, and individual species as a whole will not be greatly impacted. However, tree clearing will be conducted resulting in the loss of 28 acres of forested land. Much of the terrace area is maintained by annual mowing within the timber stand and as a result of this maintenance and the maturity of the forest there is little undergrowth in the terrace area. The greater portion of Bolivar Dam project's 532 acres has forest cover. Further, approximately 56 percent of Tuscarawas County is forested[7]. Therefore the loss of forest cover is deemed minor.

The expansion of the existing seepage blanket would also result in the loss of some herbaceous vegetation; however the blanket will be covered with approximately 6 inches of soil and vegetated with native grasses and legumes. Impacts to herbaceous vegetated lands would be temporary and deemed minor.

5.6 Regulated Hazardous Contaminants

In accordance with U.S. Army Corps of Engineers environmental policy, a Limited Phase I HTRW investigation around the dam site was completed in March 2008. Results of the Phase I indicate no HTRW concerns are anticipated on the lands affected by the proposed action. No further HTRW investigations are recommended for this area.

With the No Action Alternative increased risk of dam failure during extreme flood events would remain. However, it is likely that in a failure scenario, the Dover Dam would have a significant pool. In this case, only localized scour in stream reaches near the dam would be expected. Therefore, little probability of releases of hazardous materials would be expected as a result of the failure.

[7] Natural Resources Conservation Service, National Resource Inventory.

5.7 Aquatic resources

The proposed action would have direct impacts to wetlands. Impacts to Sandy Creek would be expected to be very minor and would occur from sedimentation during construction. Best Management Practices, such as straw bale dikes, sit fencing, temporary seeding, etc, would be used to reduce impacts to Sandy Creek from sediment laden runoff.

National Wetlands Inventory (NWI) maps are compiled by the U.S. Department of the Interior, Fish & Wildlife Service (USFWS). These maps outline existing wetlands and deepwater habitats on individual U.S. Geological Survey (USGS) topographic maps. NWI maps are prepared by stereoscopic analysis of high altitude aerial photographs. The aerial photographs typically reflect conditions during the specific year and season when they were taken. Because small wetlands and those hidden by dense forest cover may not be represented on these maps, NWI maps cannot be used as the sole method of determining the presence or absence of jurisdictional wetlands on a site. A review of the NWI map covering the subject property revealed one palustrine open water system with an intermittently exposed to permanently flooded hydrologic regime (POWZ). The area represents the old Sandy Creek channel which was relocated upon construction of the Bolivar Dam. The abandoned channel is situated immediately adjacent to the site, forming one of the site boundaries.

A jurisdictional evaluation for "waters of the U.S.," including wetlands, for the Bolivar Dam located in Bolivar, Tuscarawas County, Ohio was conducted in November 2006. Current criteria require positive indicators of hydrophytic vegetation, wetland hydrology, and hydric soils for an area to be considered a jurisdictional wetland. Three areas totaling 1.92 acres were delineated within the study area. A summary of the delineated wetland areas is presented below.

> Three forested wetlands consisting of 0.04 acre (Wetland 1), 0.17 acre (Wetland 2), and 1.71 acres (Wetland 3) and 108 linear feet (lf) of intermittent stream channel were identified as a result of the investigation. One of the three wetlands, Wetland 2, has a surface connection to other "*waters of the United States*" (Sandy Creek), while Wetlands 1 and 3 did not appear to have a surface connection to any other surface waters. Assessment of the wetlands using the Ohio Rapid Assessment Method (ORAM) scored Wetlands 1 and 3 as Category 1 wetlands and Wetland 2 as a Category 2 wetland.

Although Wetlands 1 through 3 exhibited indicators of all three wetland criteria (i.e., hydrophytic vegetation, wetland hydrology, and hydric soil characteristics), the source of hydrology for all three appears to be subsurface seepage ("boils") from the dam.

Boils have been observed in the wetlands and surrounding area as frequently as bi-annually. The area determined necessary for clearing has been minimized to the

maximum extent possible by including only the specific area with the most significant underseepage concerns.

All three wetlands would be cleared of all vegetation, including grubbing of tree root "balls". The area would then be graded and the filter blanket applied, followed by a 6-inch soil cover and seeded with an appropriate native mix. Therefore, impacts to the 1.92 acres of wetlands would be considered a permanent loss. The impacts to wetlands would be mitigated through a "mitigation bank". Use of mitigation banks is the first choice when wetlands are impacted[8]. Water Quality Certification would be required for the proposed action. The Corps is currently coordinating with the Ohio Environmental Protection Agency, Division of Water to obtain certification.

No impact to wetlands would be expected from the No Action Alternative.

5.8 Floodplain

Sandy Creek is dammed to the south of the project area, and flows north, out of the dam west of the project area. Portions of the project area lie within the Sandy Creek floodplain. According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), lands adjacent to Sandy Creek and most of the project area are within the 100-year floodplain. The proposed action involves no structures to be built in the floodplain and would result in only very minor change within the floodplain. Therefore, no significant impacts floodplains would occur.

The alternative plan and the No Action alternative would not impact the Sandy Creek floodplain.

5.9 Cultural Resources

An initial archaeological survey was completed on federally owned land managed by the Huntington District at Atwood, Beach City Lake, Bolivar Dam, Charles Mill Lake, Clendening Lake, Dillon Lake, Dover Dam, Mohawk Dam, Mohicanville Dam, Pleasant Hill Lake, and Senecaville Lake in 1982 (Brown 1982). The data produced from this survey and other surveys conducted within the basin was compiled and documented within the Corps Historic Properties Management Plan for the Muskingum Basin. Three databases maintained by the Ohio Historic Preservation Office were used for this inventory: the Ohio Archaeological Inventory (OAI), the Ohio Historic Inventory (OHI), and the National Register of Historic Properties (NRHP). The inventory recorded a number of prehistoric archaeological sites within and near the Bolivar Project.

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[8] Water Resources Development Act of 2007 (PL110-114-NOV 8, 2007) (33 USC 2317b) states: "...In carrying out a water resources project that involves wetlands mitigation and that has impacts that occur within the service area of a mitigation bank, the Secretary where appropriate, shall first consider the use of the mitigation bank if the bank contains sufficient available credits to offset the impact and the bank is approved in accordance with the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Fed. Reg. 58605) or other applicable Federal regulations).

Because of the location of the proposed project, there is a high probability that archaeological sites will be impacted by the proposed actions. An archaeological reconnaissance was completed in 2008 and a Phase I archaeological survey is currently underway. Whether further work will be required to document sites or mitigate adverse effects will not be known until survey is completed in July 2008. The Corps has engaged in consultation with the State Historic Preservation Office (SHPO), pursuant to the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA). Any necessary surveys, testing, evaluation, effect determination and mitigation planning will be performed prior to implementation of the selected alternative. Visual effects from the proposed action would include removal of trees and vegetation over a 28-acre area, construction of roads, and augmentation of the terrace filter. Coordination with the State Historic Preservation Office will be maintained throughout this process to ensure full compliance with Section 106 of the NHPA.

Under the No Action alternative, no construction related impact to cultural resources would occur. However, risk of dam failure would persist. The effects of dam failure on downstream resources are largely unpredictable. It is likely that in a failure scenario, the Dover Dam would have a significant pool. In this case, the pool would greatly curtail any erosion and scouring from increased discharges. Predicting effects on these resources during a dam failure scenario would be speculative and therefore not provide meaningful analysis.

5.10 Air Quality

According to information from the U.S. Environmental Protection Agency (EPA), the Air Quality Index for Tuscarawas County ranks in the 30th percentile of the country's worst exposure levels with zero days above 100 on the index. Tuscarawas County ranks in the 80th percentile for worst carbon monoxide emissions in the country; 70th percentile for nitrogen oxide emissions; 50th percentile for particulate matter emissions; 80th percentile for sulfur dioxide emissions, and 80th percentile for volatile organic compound emissions.

The Air Quality Index for Stark County ranks in the 80th percentile of the country's worst exposure levels with 3 to 5 days above 100 on the index for 2007. Stark County ranks in the 90th percentile for worst carbon monoxide emissions in the country; 80th percentile for nitrogen oxide emissions; 80th percentile for particulate matter emissions; 80th percentile for sulfur dioxide emissions, and 90th percentile for volatile organic compound emissions.

The use of construction equipment would result in some air emissions that temporarily impact existing air quality in the project area. Mobile sources of air pollutants are not regulated by the state except in some of the non-attainment counties. The proposed action is exempted by 40 CFR Part 93.153 from making a conformity determination, since estimated emissions from construction equipment would not be expected to exceed *deminimis* levels or direct emissions of a criteria pollutant or its precursors. Any impacts would be short-term, localized, and would occur only during construction phase

activities. Any impacts to air quality would be temporary (during construction) and very minor.

5.11 Noise

No significant noise generators are located within the project area. The project area is near an interstate highway and a municipal landfill. Existing noise sources include interstate and local traffic, farming equipment, and landfill activities.

Under the proposed action, noise in the area would be generated only during construction. The closest receptors to the construction area are homes in a residential community approximately 0.3 miles from the area in which construction would be occurring. Due to substantial distance from receivers, intermittent nature of noises and additional buffering from the rolling topography and vegetation, noise impacts of the alternative plan would not be insignificant.

No impacts due to noise would occur with the No Action Alternative.

5.12 Socioeconomics

Stark County occupies about 581 square miles and has an estimated population of 380,575. The City of Canton is the county seat. Although over 75 percent of land use is either forested, cropland, or pasture within Tuscarawas County, manufacturing is the largest employer on a countywide basis, accounting for 18 percent of total employment. Healthcare and social assistance is the second largest employment sector, followed by local government and retail. Major manufacturers include: Precision Castparts Corporation, Republic Engineered Products, and the Timken Company. Aultman Hospital; Canton City Board of Education; Fisher Food, Inc.; General Electric Company; Mercy Medical Center; and Wal-Mart Stores, Inc. are other principal employers in the county. The county unemployment rate as of the year 2006 was 5.8 percent, a little higher than the state rate of 5.5 percent. Per capita income as of 2005 was about $29,236.

Approximately 83 percent of the population includes high school graduates or individuals with more advanced degrees. About 15 percent of the county population is 65 or older. Since the early 1990s, more people have been migrating out of Stark County than into the county.

Tuscarawas County occupies about 571 square miles and has an estimated population of 91,766. The City of New Philadelphia is the county seat. Although over 90 percent of land use is either forested, cropland, or pasture within Tuscarawas County, manufacturing is the largest employer on a countywide basis, accounting for 22 percent of total employment. Healthcare and social assistance is the second largest employment sector, followed by local government and retail. Major manufacturers include: Alamo Group/Gradall Industries, Allied Machine & Engineering, Sanwa Shutter Corp/Genie Company, Smurfit-Stone Container Corporation, and Zimmer Holdings Inc. Dover City Board of Education, New Philadelphia City Board of Education, Union Hospital, and

Wal-Mart Stores, Inc. are other principal employers in the county. The county unemployment rate as of the year 2006 was 5.1 percent, a little lower than the state rate of 5.5 percent. Per capita income as of 2005 was about $25,461.

Approximately 80 percent of the population includes high school graduates or individuals with more advanced degrees. About 15 percent of the county population is 65 or older. Since 2004, more people have been migrating out of Tuscarawas County than into the county.

Under Executive Order (EO) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," federal agencies are directed to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low income populations. Minority populations are extremely low in Stark and Tuscarawas Counties compared to the predominantly Caucasian population (90.3 percent and 97.7 percent, respectively), according to the Ohio Department of Development (ODOD). The percentage of family income below the poverty level is 6.8 percent and 7.2 percent (respectively) for 1999. Based on the above demographic information, the project meets the directive of EO 12898 for the following reasons:

- The project area does disproportionately affect low-income or minority populations.
- The project would not create adverse human health or environmental effects.

The only anticipated immediate effect to the socioeconomics of Stark and Tuscarawas Counties from the proposed action would be minor input into the economy associated with construction activities and expenditures. Reducing risk of dam failure would have a positive effect on downstream communities.

The No Action alternative would not provide for reduction in risk of dam failure and would therefore be expected to have potential for adverse effects on socioeconomics in areas downstream of the dam.

5.13 Aesthetics

Proposed activities would occur in an area that is largely undeveloped. With the exception of the existing dam and associated USACE facilities, remaining areas are characterized by natural habitats including forests, shrub areas, and wetlands. Clearing of trees could be thought of by some as having an adverse effect. All cleared areas would be re-vegetated with native grasses and forbs, and therefore could be considered more visually appealing. Therefore, impacts on aesthetics form the proposed action are largely subjective and not deemed significant.

With the No Action Alternative, there would be no construction related adverse effect on aesthetic resources.

5.14 Transportation and Traffic

Major roads surrounding the Bolivar Dam area include Interstate 77 running along the western boundary and Gracemont Street running along the northern boundary. Gracemont Street appears to have large truck traffic associated with the landfill operations on the north side of the street. Lexy Road runs along the crest of the dam.

Transportation or traffic on Interstate 77 would not be affected in any way by the proposed action. Gracemont Street and Lexy Road would probably have a minor and temporary traffic increase from the use of construction equipment. Impacts on transportation would be expected to be very minor.

5.15 Cumulative Effects

Cumulative effects are "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations).

The cumulative effects analysis qualitatively presented below is based on the potential effects of the proposed project when added to similar impacts from other projects in the region. An inherent part of the cumulative effects analysis is the uncertainty surrounding actions that have not yet been fully developed. The CEQ regulations provide for the inclusion of uncertainties in the analysis and states that "when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment....and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (40 CFR 1502.22). The CEQ regulations do not state that the analysis cannot be performed if the information is lacking.

The proposed project may be considered as a modification of the existing dam. The effects as discussed beforehand are localized and minor. In scoping past present and future actions, the spatial, or geographic, limits for analyses of actions that may contribute cumulative with the proposed action would appropriately be limited to the dam and vicinity. Past actions that may contribute to cumulative effects would be construction of the parapet wall conducted as part of the Dam Safety Assurance Program, implementation of certain IRRMs, and the total of improvements that have been made to the Bolivar project since original construction (e.g. additional facilities). No reasonably foreseeable future actions that would have similar impacts as the proposed action were identified. In scoping cumulative effects issues, no resources were identified as having a potential to be significantly affected.

6.0 Environmental Requirements and Protection Statutes

Listed below are federal statutes, state, Corps and local regulations applicable to the proposed action. Throughout the process of developing this assessment, coordination pursuant to the Fish and Wildlife Coordination Act and Endangered Species Act has been maintained with the US Fish and Wildlife Service and appropriate state resource agencies.

Federal Statutes

- Archeological and Historic Preservation Act as Amended, 16 U.S.C. 469, et seq.
- Clean Air Act as amended, 42 U.S.C. 7401, et. seq.
  Clean Water Act (Federal Water Pollution Control Act) as amended, 336 U.S.C. 1251, et seq.
- Endangered Species Act as amended, 16 U.S.C. 1531 et seq.
- Farmland Protection Policy Act, PL 97-98, 7CFR 658
- Federal Water Project Recreation Act as amended, 16 U.S.C 661, et seq.
- Fish and Wildlife Coordination Act as amended, 16 U.S.C. 661 et seq.
- Land and Water Conservation Fund Act as amended, 42 U.S.C. 4601-4601-11, et. seq.
- National Environmental Policy Act as amended 42 U.S.C. 4321, et. seq.
- National Historic Preservation Act as amended, 16 U.S.C. 470a, et seq.
- Rivers and Harbors Act, 33 U.S.C. 401, et seq.
- Watershed Protection and Flood Prevention Act 16 U.S.C. 1001, et seq.
- Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601, et seq.

Executive Orders

- Floodplain Management (E.O. 11988)
- Protection of Wetlands (E.O. 11990)
- Environmental Justice (E.O. 12898)

State, Local and USACE Policy

- Hazardous, Toxic and Radioactive Waste (HTRW) Guidance, ER 1165-2-132

7.0 Coordination and Correspondence

Coordination with various federal, state and local agencies was undertaken during the preparation of this report. The *Bolivar Dam Interim Risk Reduction Measures Draft Environmental Assessment* will be made available to federal and state resource agencies

as well as the general public and other interested agencies, groups and individuals for a 30-day review period.

A notice will be published in newspaper(s) of local circulation concerning availability of this document. The Corps will give consideration to all comments received as a result of the 30-day review period and document these considerations in the final environmental assessment as appropriate.

8.0 Conclusion

The major features of the proposed action include tree removal, downstream access improvement, terrace seepage blanket augmentation, and construction of an area for stockpile of granular material. The Huntington District has taken reasonable measures to assemble and present the known or foreseeable environmental impacts of the project in this environmental assessment. Wetland impacts as a direct result of the proposed action would affect 1.92 acres of Class 1 and Class 2 wetlands. Mitigation for wetland impacts is proposed thorough an approved wetland mitigation bank, consistent with statute. All adverse effects of project implementation are insignificant or may be avoided through management techniques, or mitigated in the case of wetland impacts. Therefore, no significant impacts to the human environmental would occur as a result of implementation of the measures comprising the proposed action.

APPENDIX A

Distribution List

Distribution List

Federal Agencies and Elected Officials

United States Senators
Honorable George V. Voinovich
524 Hart Senate Office Building
Washington, DC 20510

Honorable Sherrod Brown
2332 Rayburn Building
Washington, DC 20515

Representatives in Congress
Honorable Zach Space
714 North Wooster Avenue
Dover, OH 44622

US Department of Agriculture
Natural Resources Conservation Service
District Conservationist
New Philadelphia Service Center
277 Canal Avenue
SE, Suite B
New Philadelphia, OH 44663-6902

US Department of the Interior
Fish and Wildlife Service
Field Supervisor
6950 Americana Parkway
Suite A
Reynoldsburg, OH 43068

State Agencies and Elected Officials

Office of the Governor
Governor Ted Strickland
309 South 4th Street
Suite 100
Columbus, OH 43215

Ohio Department of Transportation
1980 W. Broad St.
Columbus, OH 43223

Ohio Dept. of Environmental Protection
State Environmental Review Officer
8995 East Main Street
Building #22
Reynoldsburg, OH 43068

Ohio Historic Preservation Office
Mark J. Epstein, Department Head
Resource Protection and Review
567 East Hudson Street
Columbus, Ohio 43211

Ohio Environmental Protection Agency
Mr. George Elmaraghy
Division of Surface Water
P. O. Box 1049
Columbus, Ohio 43216-1049

Ohio Department of Natural Resources
Mark Shieldcastel, Project Leader
Division of Wildlife
13229 W. State Rt. 2
Oak Harbor, Ohio 43449

Local Agencies and Officials

Muskingum Watershed Conservancy District
Mark Jukich
1319 Third St. NW
P.O. Box 349
New Philadelphia, OH 44663

Stark County Commission
110 Central Plaza South
Canton, OH 44702

Tuscarawas County Commission
125 East High Avenue
New Philadelphia, OH 44663

Tuscarawas County Emergency Management
2295 Reiser Ave SE
New Philadelphia, OH 44663

Stark County Emergency Management
4500 Atlantic Blvd-LL
Canton, OH 44705

City Government Offices

Mayor Richard Homrighausen
City Hall
110 East 3rd St
Dover, OH 44622

Mayor Ronald Brodzinski
150 East High Avenue
New Philadelphia, OH 44663

Mayor Patricia White
PO Box 117
Bolivar, OH 44612

Dover Fire Department
116 E 3rd St
Dover, OH 44622

New Philadelphia Fire Department
108 2nd St SE
New Philadelphia, OH 44663

Tuscarawas County Chamber of Commerce
1323 4th Street NW
New Philadelphia, OH 44663

Bolivar Fire Department
P.O. BOX 136
Bolivar, Ohio 44612-0136

Public Libraries

Tuscarawas County Public Library

121 Fair Avenue NW
New Philadelphia, OH 44663

455 West Water Street
Bolivar, OH 44612

Stark County Library
Sandy Valley Branch
9754 Cleveland Avenue SE
Magnolia, Ohio 44643